

FIG. 1

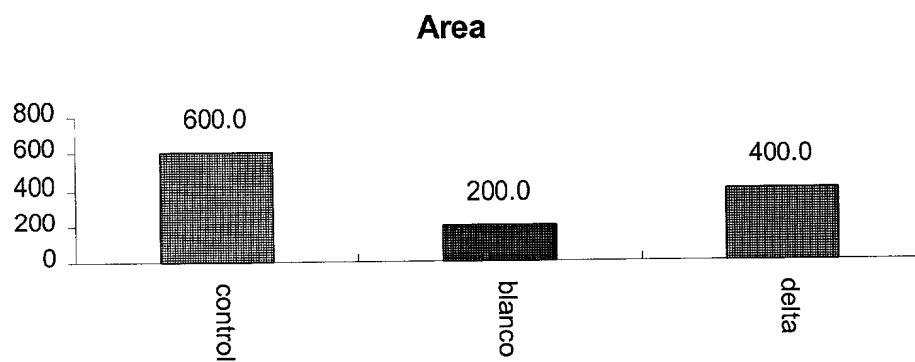


FIG. 2

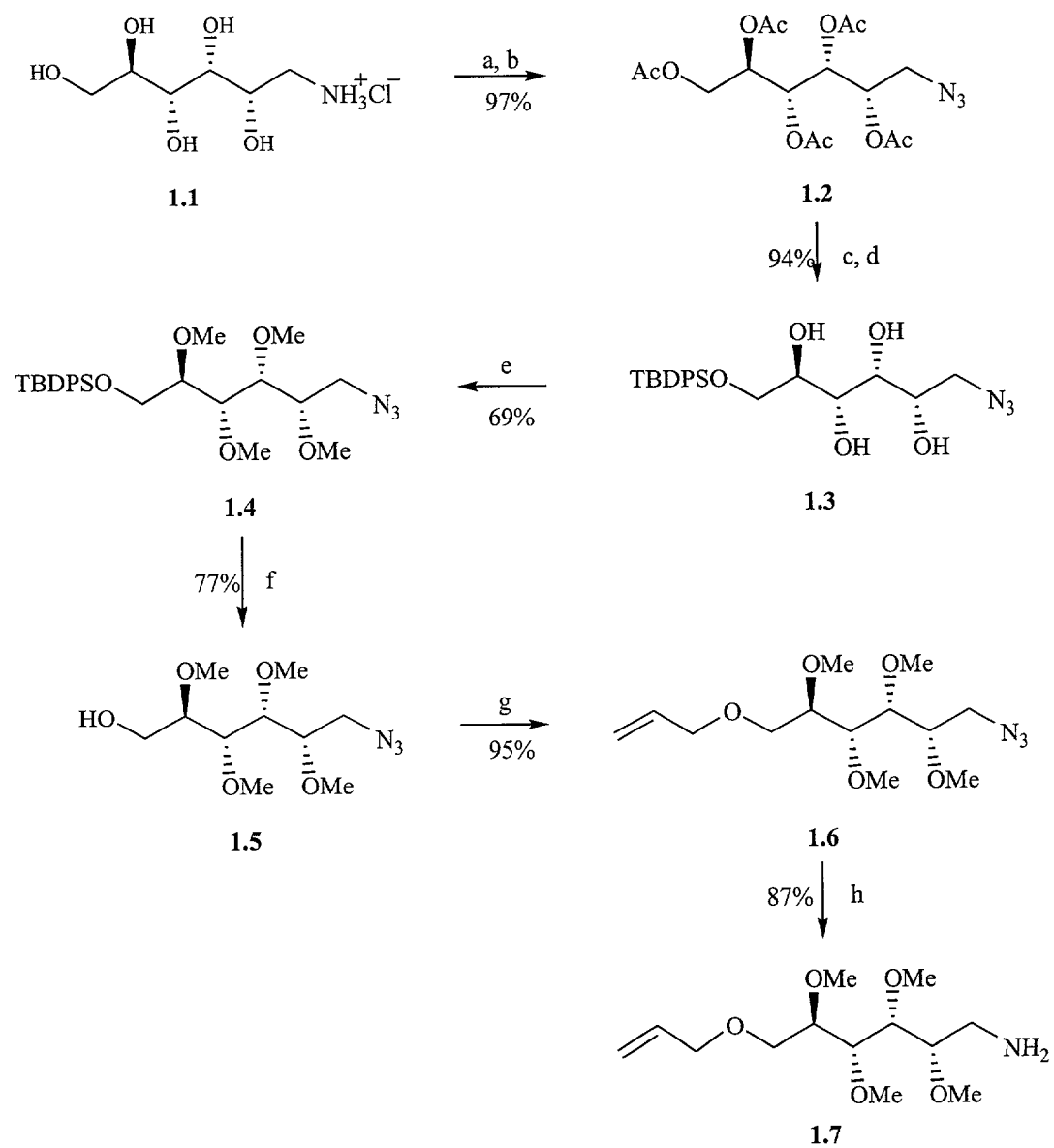


FIG. 3

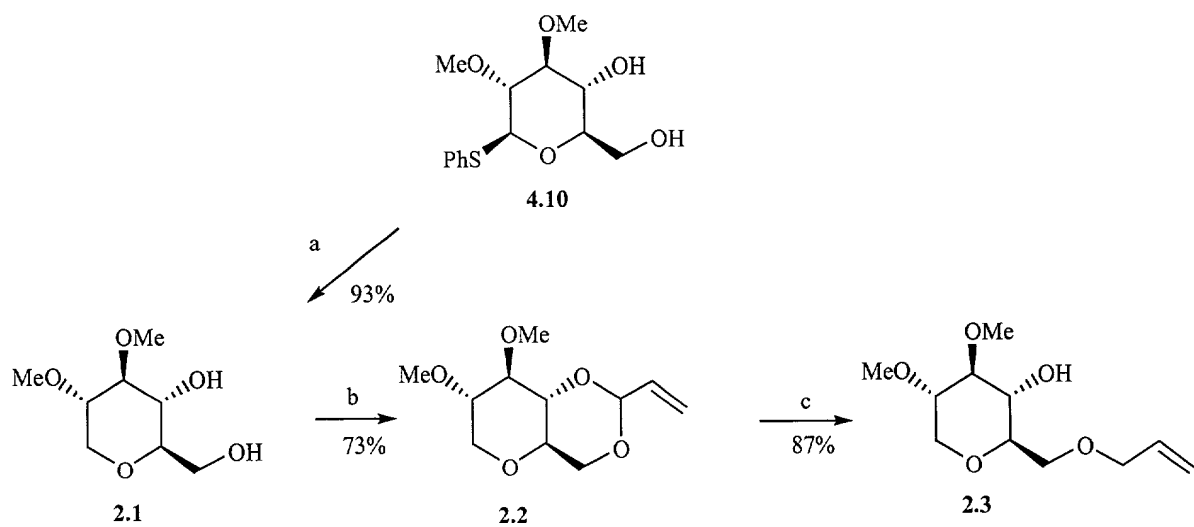


FIG. 4

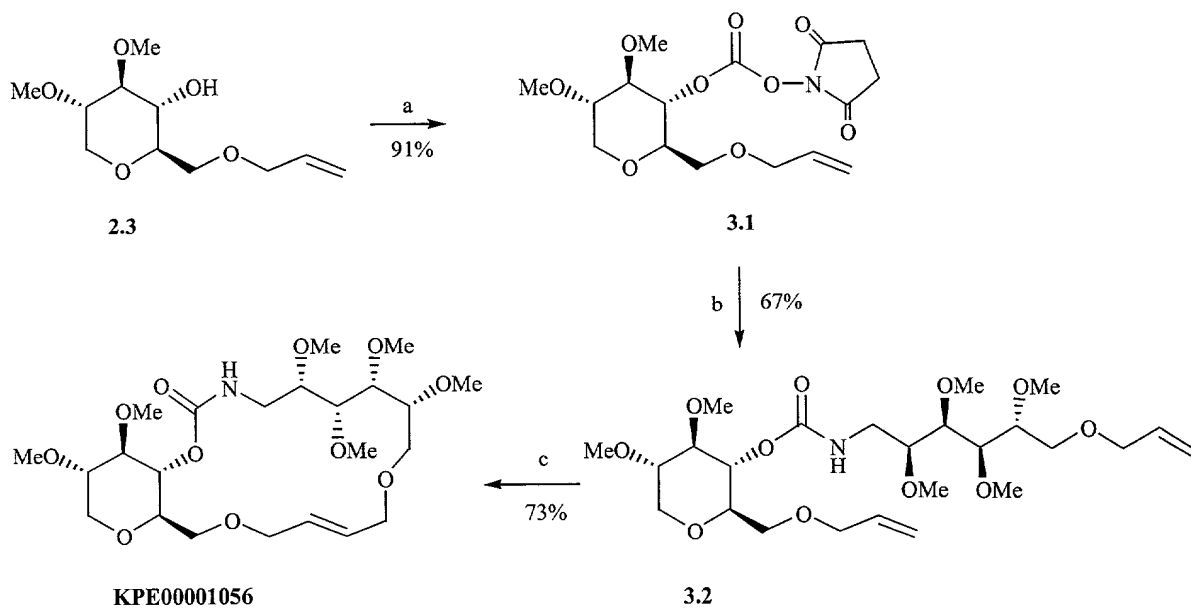
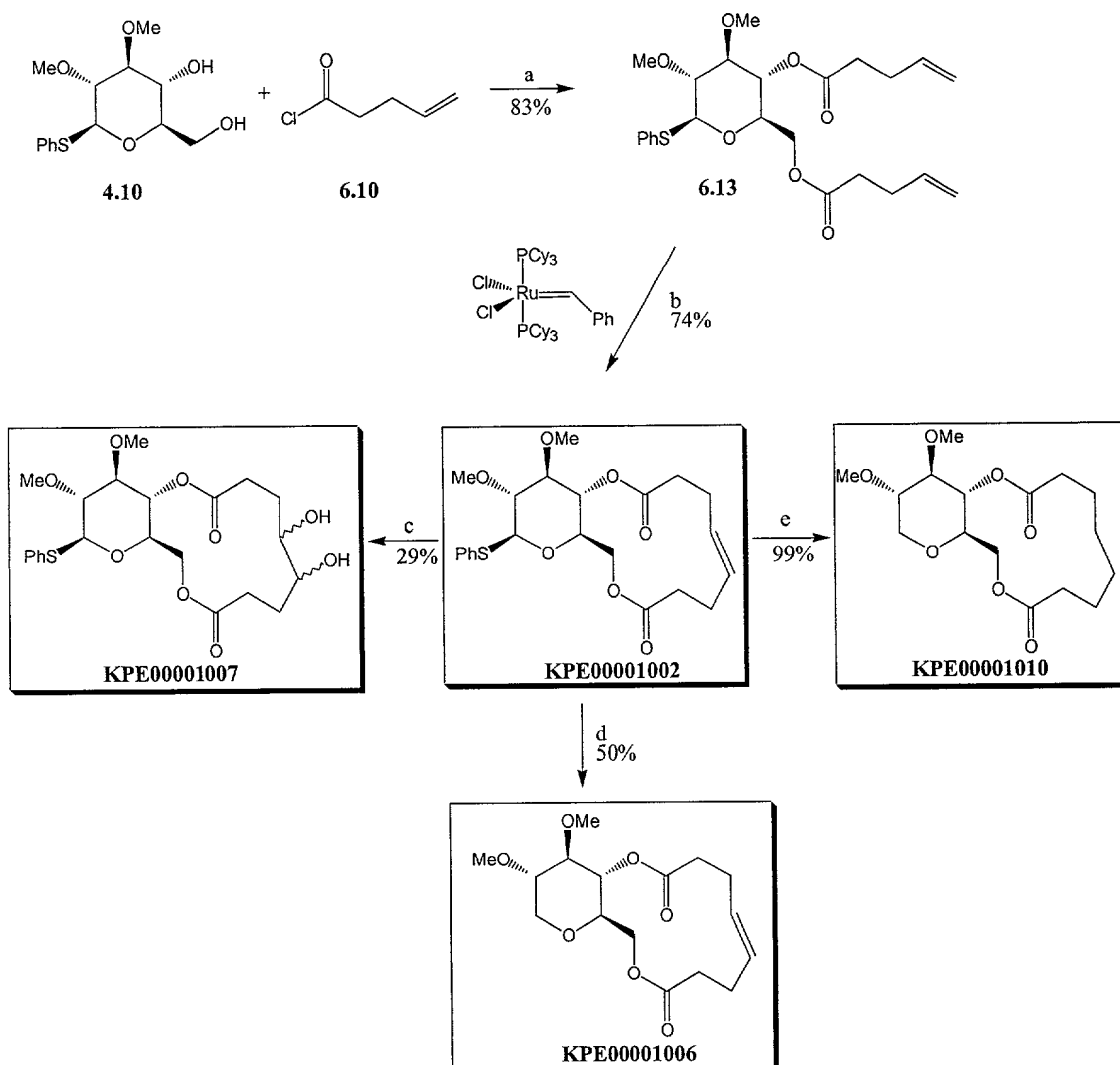
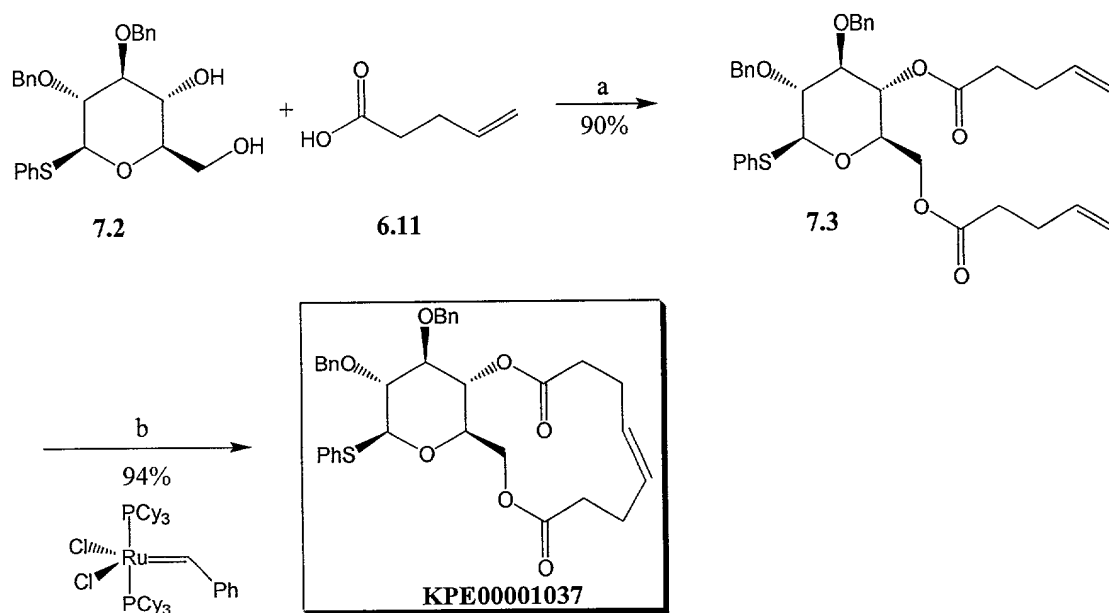


FIG. 5



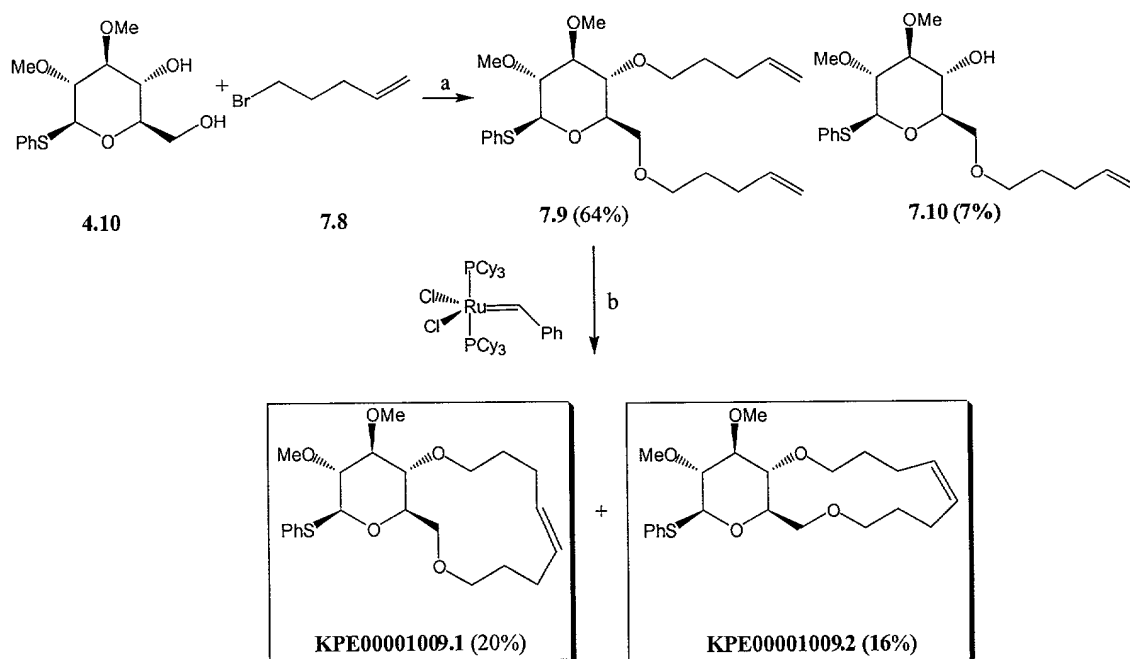
a) pyridine, DMAP, CH₂Cl₂, r.t., 18 h; b) Grubb's cat. 10 mol%, CH₂Cl₂, r.t., 48 h;
 c) OsO₄, NMMO, t.BuOH, acetone/H₂O, 2.5/1, r.t., 1 h; d) Raney-Ni, EtOH, r.t., 1 h;
 e) Raney-Ni, H₂, EtOH, r.t., 1 h.

FIG. 6



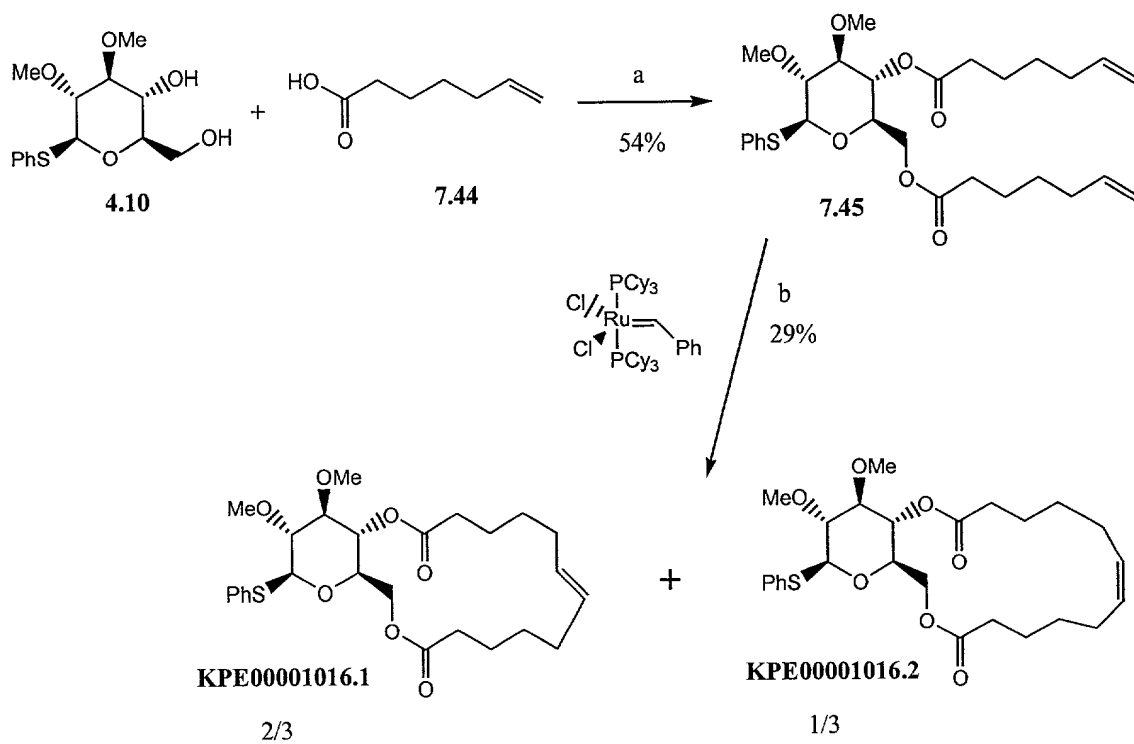
a) DIC, HOBT, DMAP, CH_2Cl_2 , r.t., 120 h; b) Grubb's cat. 10 mol%, CH_2Cl_2 , r.t., 95 h;

FIG. 7



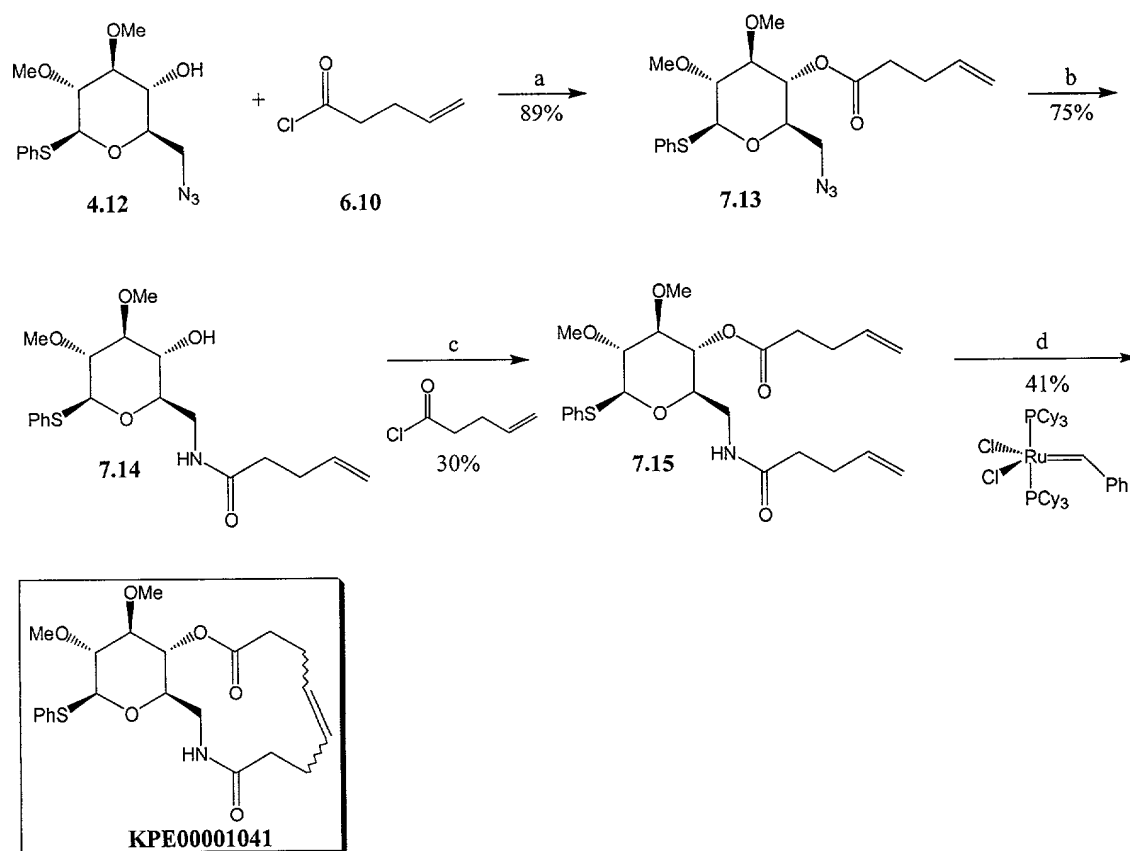
a) NaH, TBAI, THF, 0°C to r.t., 42 h; b) Grubb's cat. 20 mol%, CH_2Cl_2 , r.t., 48 h;

FIG. 8



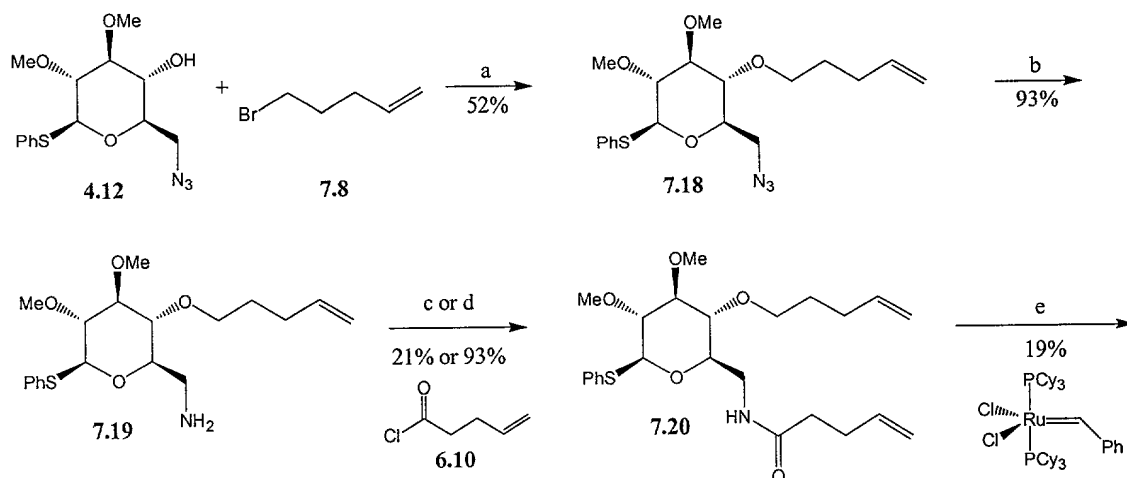
a) DIC, HOBt, DMAP, CH_2Cl_2 , r.t., 72h; b) Grubbs' cat. 10 mol%, CH_2Cl_2 , r.t., 46h.

FIG. 9



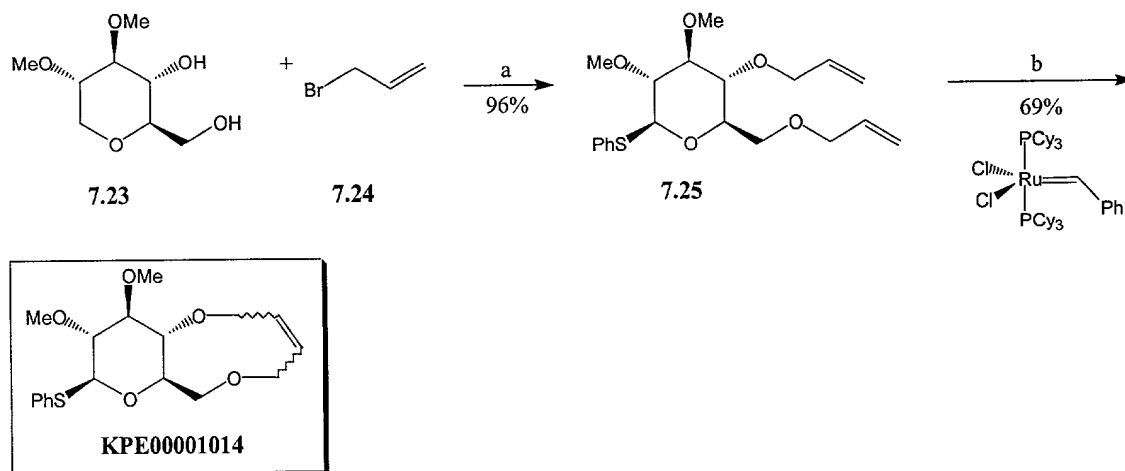
a) pyridine, DMAP, CH_2Cl_2 , r.t., 24 h; b) PPh_3 (polystyrene carrier), $\text{THF}/\text{H}_2\text{O}$, 100/1, r.t., 48 h;
 c) Et_3N , CH_2Cl_2 , r.t., 24 h; d) Grubb's cat. 30 mol%, CH_2Cl_2 , reflux, 16 h;

FIG. 10



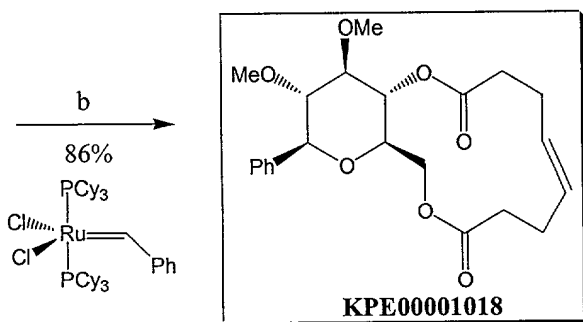
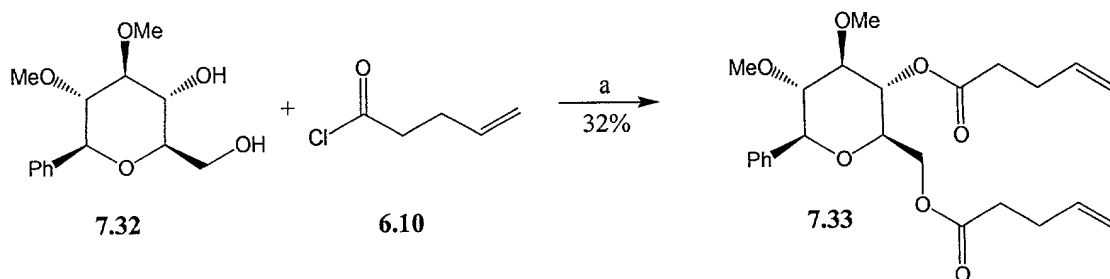
a) NaH, TBAI, THF, 0°C to r.t., 24 h; b) PPh₃, THF/H₂O, 100/1, r.t., 48 h; c) DIPEA, CH₂Cl₂, r.t., 19 h; d) pyridine, DMAP, CH₂Cl₂, 0°C to r.t., 2 h; e) Grubb's cat 20 mol%, CH₂Cl₂, r.t., 18 h;

FIG. 11



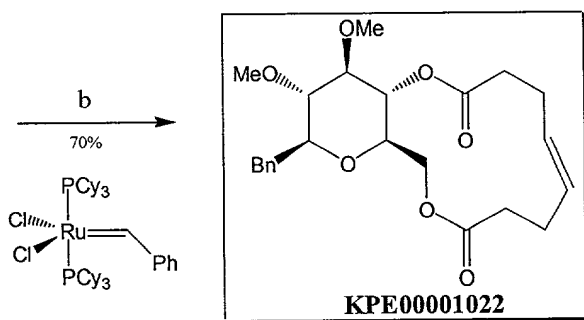
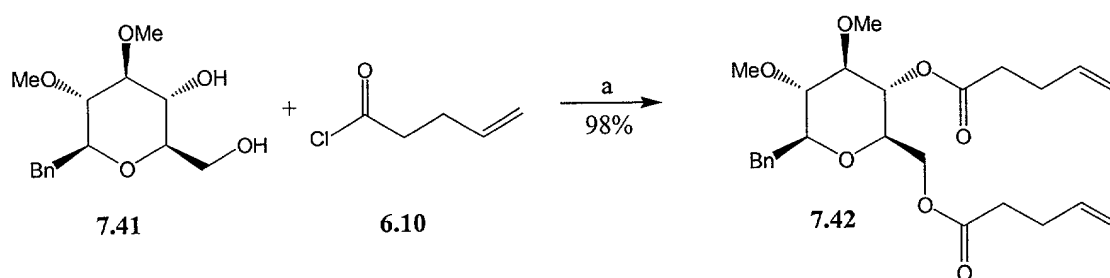
a) NaH, TBAI, THF, 0°C to r.t., 18 h; b) Grubb's cat 10 mol%, CH₂Cl₂, r.t., 48 h;

FIG. 12



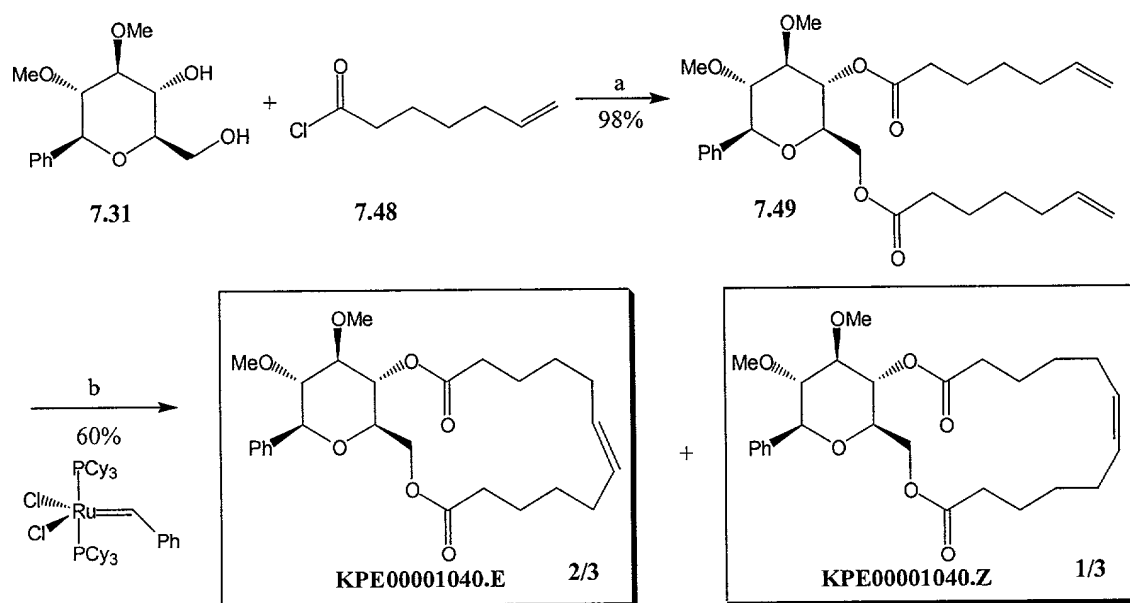
a) pyridine, DMF, 90°C, 2 h; b) Grubb's cat. 10 mol%, CH₂Cl₂, r.t., 72 h;

FIG. 13



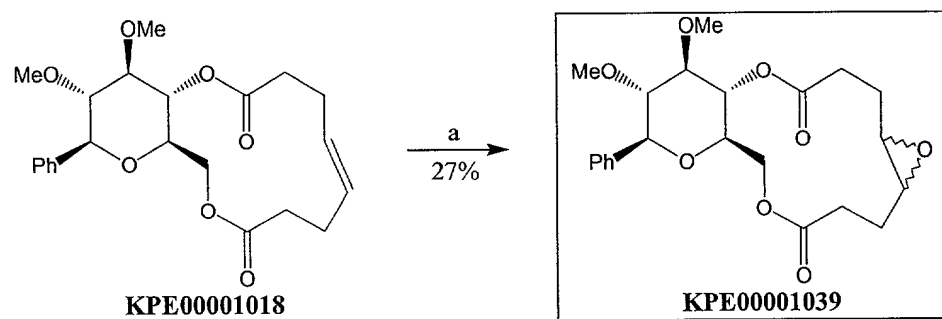
a) pyridine, DMAP, CH₂Cl₂, 0°C, 22 h; b) Grubb's cat. 12 mol%, CH₂Cl₂, r.t., 48 h;

FIG. 14



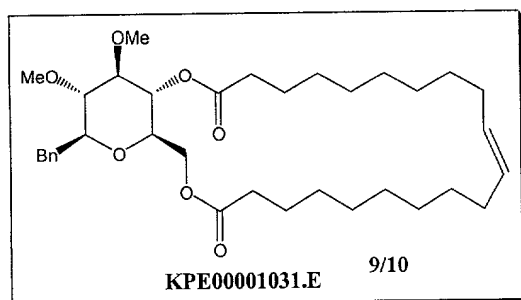
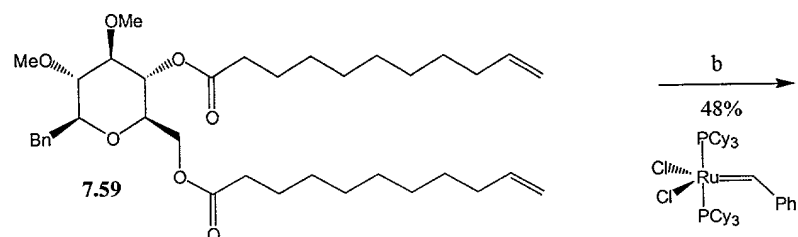
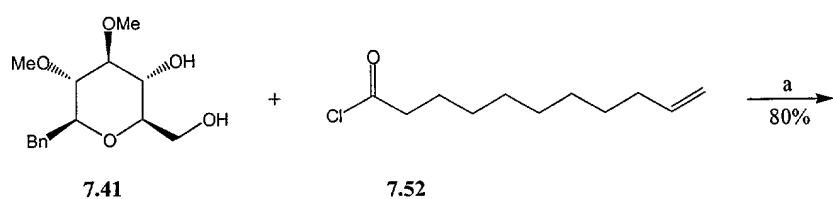
a) pyridine, DMAP, CH_2Cl_2 , 0°C to r.t., 18 h; b) Grubb's cat. 10 mol%, CH_2Cl_2 , r.t., 46 h;

FIG. 15

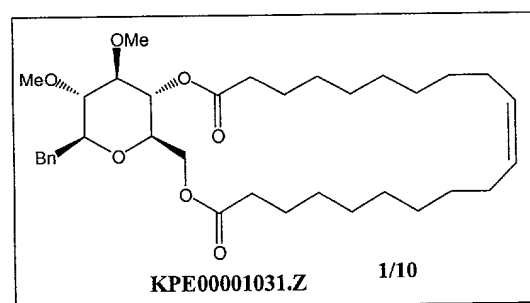


a) mCPBA, CH_2Cl_2 , r.t., 72 h

FIG. 16



+



a) pyridine, DMAP, CH_2Cl_2 , 0°C to r.t., 18 h; b) Grubb's cat. 10 mol%, CH_2Cl_2 , r.t., 18 h;

FIG. 17

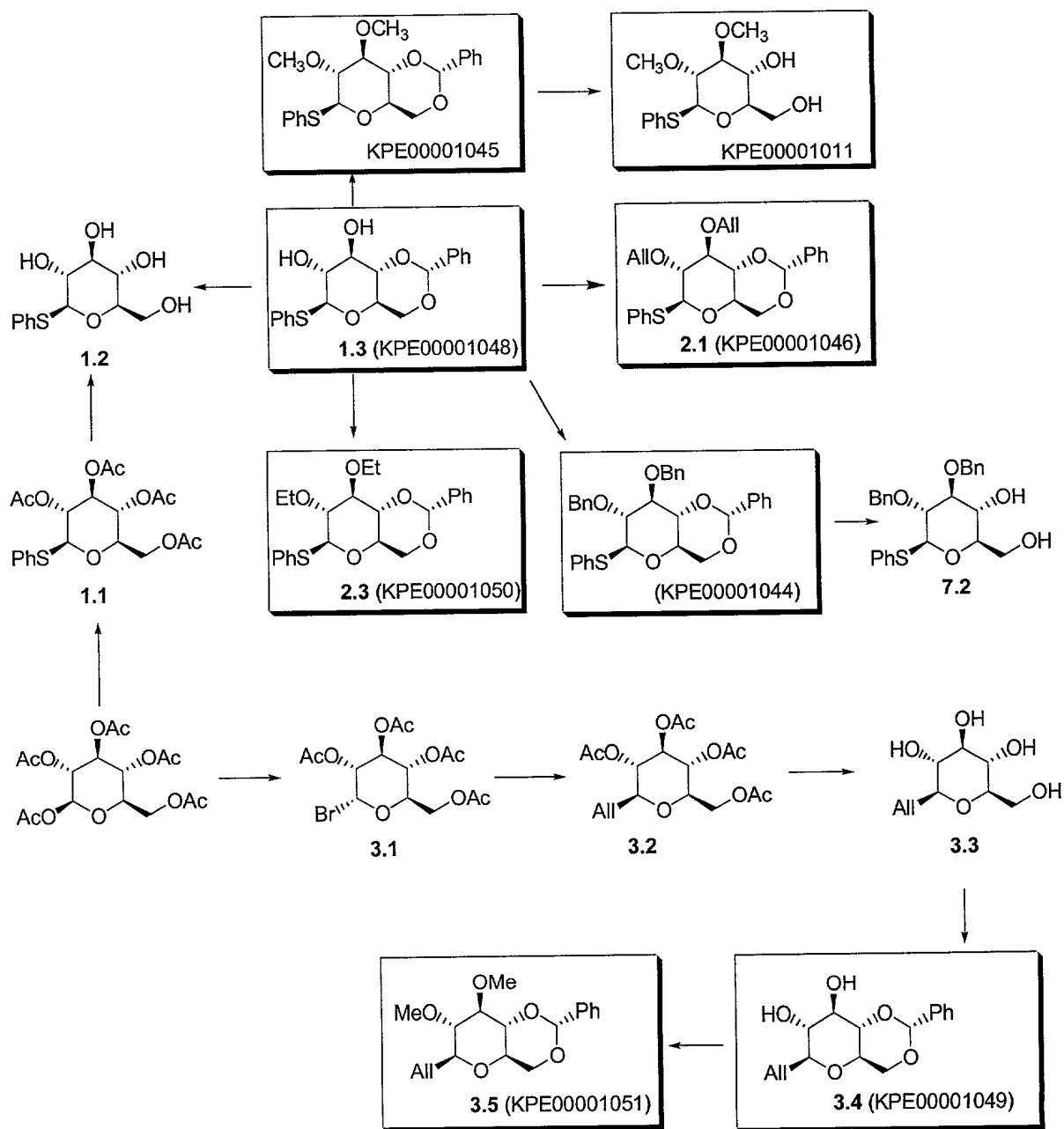


FIG. 18

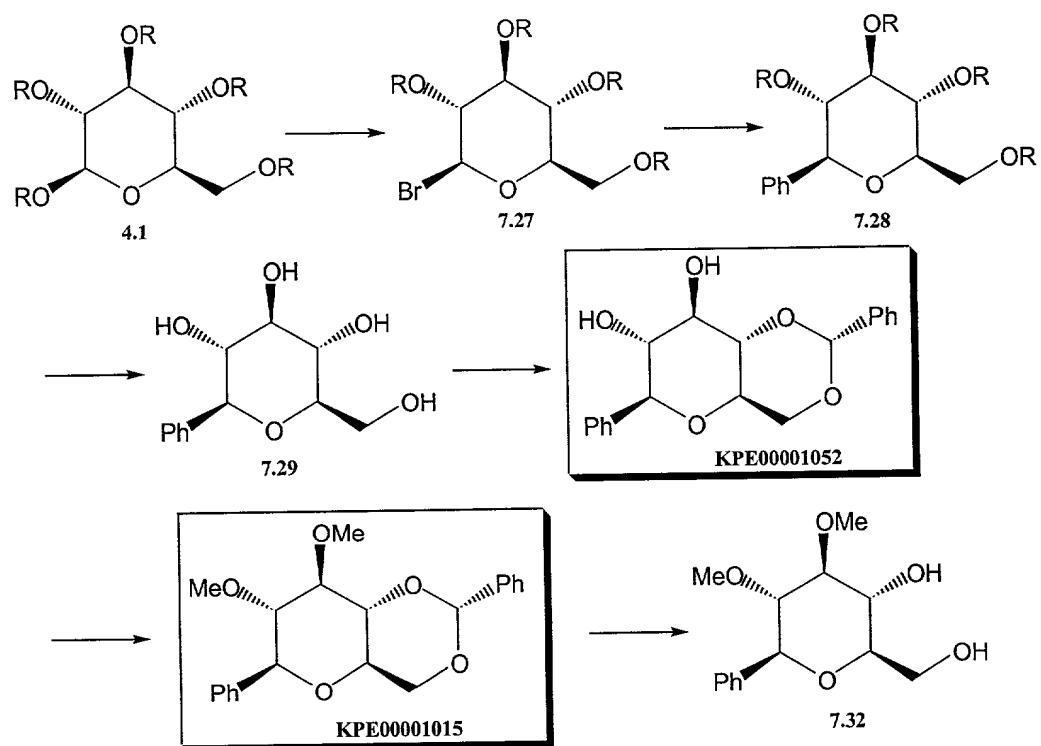


FIG. 19

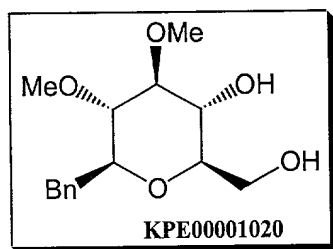
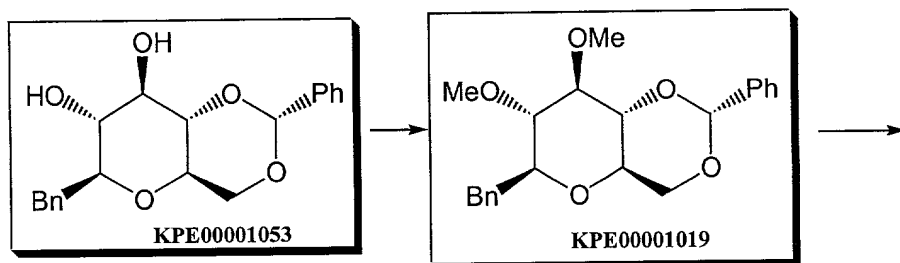
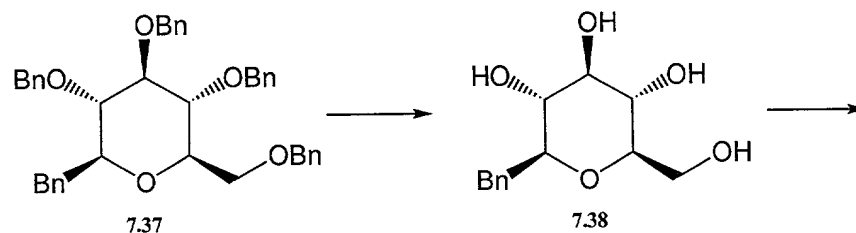
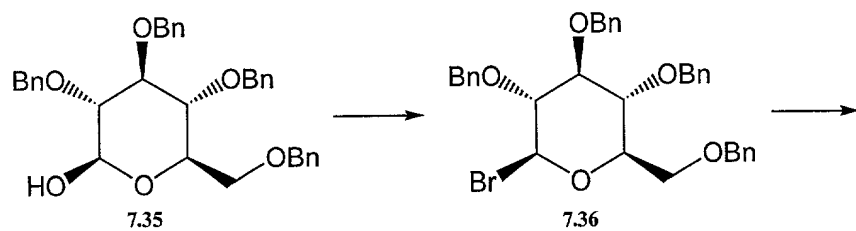


FIG. 20